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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,201	12/19/2001	Gijs Van Rooijen	38814-351B	4943

24961 7590 11/14/2003

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EXAMINER	
FOX, DAVID T	

ART UNIT	PAPER NUMBER
1638	

DATE MAILED: 11/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/032,201	ROOIJEN ET AL.	
	Examiner	Art Unit	
	David T. Fox	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) *3,5-7,9-14,17-19 and 21-28* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,8,15,16 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11+14
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Applicant's election without traverse of Group I in the Election filed 25 July 2003 is acknowledged.

Claims 1-2, 4, 8, 15-16 and 20 are being examined to the extent that they read on the elected invention, namely methods for transforming fungal and animal cells with chimeric nucleic acid sequences encoding an oil body protein fused to thioredoxin and thioredoxin reductase. The claims should be amended to reflect this subject matter.

Receipt of the Petition filed 25 July 2003 under 37 CFR 1.53(e) is acknowledged. The petition has been forwarded to the appropriate Official for a decision.

Applicants are requested to re-submit the amendment to page 1 of the specification, first submitted on 29 August 2002 but non-entered due to the absence of page 1 at that time.

The application should be reviewed for errors. Errors appear, for example, in claim 8, line 6, where --is-- should be inserted after "polypeptide".

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-2, 4, 8,15-16 and 20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 10-11, 14-16 and 19-20 of U.S. Patent No. 5,948,682. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one of ordinary skill in the art to utilize the methods for expressing in yeast cells heterologous fusion proteins comprising an oil body targeting protein and an enzyme, and the chimeric nucleotide sequences encoding said fusion proteins, as claimed in the patent, to obtain the methods for expressing in fungal cells (including yeast) heterologous fusion proteins comprising an oil body targeting protein and a thioredoxin or thioredoxin reductase enzyme, and chimeric nucleotides sequences encoding said fusion proteins, as claimed in the instant application. The claims are co-extensive.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 20 is indefinite for employing improper Markush terminology. See MPEP 2173.05(h). The following amendments would obviate this rejection:

In the last line, insert --the group consisting of-- before "thioredoxin", first occurrence; and replace "or" with --and-- .

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-2, 4, 8, 15-16 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are broadly drawn to chimeric genes comprising any type of thioredoxin reductase gene of any sequence and from any source, and methods of their use to transform fungal and animal cells. Claim 20 is broadly drawn to a multitude of genes encoding a multitude of "active fragments" of any length and sequence of any thioredoxin or thioredoxin reductase. In contrast, the specification and cited prior art only provide guidance for NADPH thioredoxin reductase genes and methods for their use, and for the use of entire thioredoxin genes or entire NADPH thioredoxin reductase genes. No guidance is provided for the isolation or characterization of other thioredoxin enzymes such as ferredoxin reductase, or for the isolation or characterization of any genes encoding it. Furthermore, no guidance is provided for the isolation or characterization of a multitude of fragments of any size and sequence from a multitude of thioredoxin genes or thioredoxin reductase genes.

The Federal Circuit has recently clarified the application of the written description requirement. The court stated that a written description of an invention "requires a precise definition, such as by structure, formula, [or] chemical name, of the claimed

subject matter sufficient to distinguish it from other materials." University of California v. Eli Lilly and Co., 119 F.3d 1559, 1568; 43 USPQ2d 1398, 1406 (Fed. Cir. 1997). The court also concluded that "naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material." Id. Further, the court held that to adequately describe a claimed genus, Patent Owner must describe a representative number of the species of the claimed genus, and that one of skill in the art should be able to "visualize or recognize the identity of the members of the genus." Id.

See MPEP Section 2163, page 156 of Chapter 2100 of the August 2001 version, column 2, bottom paragraph, where it is taught that

> [T]he claimed invention as a whole may not be adequately described where an invention is described solely in terms of a method of its making coupled with its function and there is no described or art-recognized correlation or relationship between the structure of the invention and its function. A biomolecule sequence described only by a functional characteristic, without any known or disclosed correlation between that function and the structure of the sequence, normally is not a sufficient identifying characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence.

Given the claim breadth and lack of guidance as discussed above, the specification fails to provide an adequate written description of the genus of sequences as broadly claimed. Given the lack of written description of the claimed genus of sequences, any method of using them, such as transforming fungal cells therewith, and the resultant products including the claimed transformed fungal cells containing the genus of sequences, would also be inadequately described. Accordingly, one skilled in the art would not have recognized Applicant to have been in possession of the claimed invention at the time of filing. See the Written Description Requirement guidelines

published in Federal Register/ Vol. 66, No. 4/ Friday January 5, 2001/ Notices: pp. 1099-1111).

See also Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 18 USPQ 2d 1016 at 1021, (Fed. Cir. 1991) where it is taught that a gene (which includes a promoter) is not reduced to practice until the inventor can define it by "its physical or chemical properties" (e.g. a DNA sequence).

See also University of California v. Eli Lilly and Co., 43 USPQ2d 1398 (Fed. Cir. 1997), which teaches that the disclosure of a process for obtaining cDNA from a particular organism and the description of the encoded protein fail to provide an adequate written description of the actual cDNA from that organism which would encode the protein from that organism, despite the disclosure of a cDNA encoding that protein from another organism.

Claims 1-2 and 8 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for claims limited to methods of transforming fungal or animal cells with constructs encoding fusion proteins comprising an oil body targeting protein linked to a thioredoxin protein or an NADPH thioredoxin reductase protein, does not reasonably provide enablement for claims broadly drawn to any method for somehow "associating" thioredoxin or thioredoxin reductase with oil body proteins. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are broadly drawn to any method for somehow "associating" heterologous thioredoxin or thioredoxin reductase proteins with oil body proteins or oil

bodies in a multitude of transformed fungal or animal cells. In contrast, the specification only provides guidance for the association of heterologous thioredoxin and NADPH thioredoxin reductase proteins with oil bodies when the heterologous proteins are expressed as fusion proteins with oil body proteins. No guidance is provided for any other means of associating heterologous proteins with oil bodies in transformed yeast or animal cells.

The localization of heterologous proteins in transformed cells is unpredictable. See, e.g., Turk et al, page 29, Abstract, who teach that a signal peptide did not properly target an associated protein of interest to the desired and predicted location.

Given the claim breadth, unpredictability, and lack of guidance as discussed above, undue experimentation would have been required by one skilled in the art to identify, develop and evaluate a multitude of non-exemplified methods and nucleic acid constructs for somehow associating heterologous thioredoxin and thioredoxin reductase proteins with oil bodies or oil body proteins in transformed fungal and animal cells.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> **A person shall be entitled to a patent unless –**
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by Ting et al.

The claim is broadly drawn to a nucleic acid construct encoding a fusion protein comprising an oil body protein fragment and a fragment of thioredoxin or thioredoxin reductase of any length and sequence.

Ting et al teach a nucleic acid construct comprising a yeast-expressible promoter ligated to a gene encoding a maize oil body protein (see, e.g., page 3699, Abstract and page 3701, Figure 1). The oil body protein gene comprises a portion encoding an active fragment of an oil body protein, and the oil body protein gene would inherently contain a fragment of at least one base pair of a thioredoxin gene or a thioredoxin reductase gene.

Claims 1-2, 4, 8 and 15-16 are deemed free of the prior art, given the failure of the prior art to teach or suggest nucleic acid constructs encoding fusion proteins comprising an oil body protein and another protein of interest, wherein said nucleic acid constructs are introduced into fungal (yeast) cells, as stated in allowed commonly owned application Serial No. 08/846,021, now U.S. Patent 5,948,682; and given the failure of the prior art to teach or suggest nucleic acid constructs encoding fusion proteins comprising an oil body protein and an entire thioredoxin or thioredoxin reductase protein, as stated in commonly owned and copending application Serial No. 09/897,425.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David T. Fox whose telephone number is (703) 308-0280. The examiner can normally be reached on Monday through Friday from 10:30AM to 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached on (703) 306-3218. The fax phone number for this Group is (703) 872-9306. The after final fax phone number is (703) 872-9307.

November 10, 2003

DAVID T. FOX
PRIMARY EXAMINER
GROUP ~~180~~ 1638